Health & Safety Manual

Supplement 2.10

Guidelines for the Shutdown or Transfer of Operations or Buildings

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Approved by the ES&H Working Group

_____ **date** _____

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*** Revised**

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1.0 Introduction

Laboratory policy requires buildings and equipment contaminated with radioactive or other hazardous materials to be managed safely at all times to ensure the protection of employees and the public. In addition, any building or major operation that will be temporarily or permanently shut down requires a Shutdown, Surveillance, and Maintenance Plan (described further in this supplement). A temporary shutdown is for a period of time up to but not exceeding one year, and does not include the temporary suspension of activities in the building. A permanent shutdown (or mothballing) of a building for future use or other disposition is usually for more than one year. Similar hazard assessment and planning considerations may be necessary for the transfer of operations or work space to another organization.

This supplement contains the environmental, safety, and health (ES&H) elements of shutdown and transfer plans and recommendations for Programs planning to shut down major operations or a building, deactivate parts of a building and its associated operations, or transfer responsibility for a building or workspace to another organization. These recommendations are outlined according to individual ES&H disciplines and are intended to be general in nature. Where specific recommendations are necessary, consult the responsible ES&H team.

Decontamination and decommissioning activities, where required, shall be accomplished in accordance with the guidance in Supplement 2.30 (Guidelines for Decontamination and Disposition of Process Contaminated Buildings and Associated Equipment) of the *Health & Safety Manual*. “Process contamination” is contamination due to programmatic operations. It does not include construction materials (i.e., asbestos or PCB-containing oils) or background contamination that is indigenous but higher than that specified in the standards.

2.0 Applicability

The guidance in this supplement should be applied using a graded approach to the temporary or permanent shutdown of buildings or operations, and to the transfer of responsibilities for operations and work spaces to another organization. At the lowest end of the graded approach would be routine transfer of an office trailer, warehouse, or office building with no hazardous operations or materials to another directorate. In such cases, a written Shutdown, Surveillance, and Maintenance Plan would not be required because the “Facility Condition Disclosure” form (from the

Policy and Procedure for the Disposition of Space) would indicate that the trailer or building was not contaminated. A plan also would not be required if the same office trailer or office building were to be shut down for immediate demolition because existing Plant Operations procedures and the *Health & Safety Manual* cover the activities involved. However, one would be required if the same office trailer or office building were to be mothballed and for all other lab, shop, and contaminated office buildings. The detail and extent of the plan would depend on the particular building.

3.0 Requirements/Regulatory Summary

The guidelines in this supplement are governed by the Laboratory's ES&H policies, applicable DOE orders, and other federal and State of California laws and regulations.

4.0 Shutdown and Transfer Guidelines

All documentation pertinent to building closure, shutdown, modifications, continuing operations, and maintenance—including a copy of the Shutdown, Surveillance, and Maintenance Plan—must be sent to the Plant Engineering Documentation Group and the ES&H team. This information may be required later for formal reporting to DOE.

4.1 Plan Format

A Shutdown, Surveillance, and Maintenance Plan shall include

- A description of the building (or parts of the building) or operation involved.
- The name of the individual within the Program responsible for developing and implementing the plan.
- A brief description of the potential hazards that may be present during and after shutdown.
- Specific procedures for
  - Safely shutting down the operation.
  - Meeting regulatory requirements regarding compliance with the National Environmental Protection Act (NEPA) and existing permit conditions; or closing permitted operations, managing wastes, and closing waste management areas (e.g., waste accumulation areas (WAA)) and retention tank systems.
  - Performing ES&H surveillance.
  - Performing maintenance and inspection.

A simpler plan (shown in Appendix A) may be used when

- A shutdown or the transfer of responsibility involves relatively small-scale operations.
- An individual laboratory, shop, or experiment is shut down.
- The responsible person transfers to another job.
- Responsibility for a work space is transferred to another individual or organization.

4.2 Plan for Temporary Shutdown

When it is necessary to shutdown an experiment or building temporarily (less than 12 months), follow the guidelines below for the pre-shutdown, surveillance, and maintenance phases. The surveillance recommendations provided are to ensure that the inactive building remains safe and meets regulatory requirements.

4.2.1 Pre-Shutdown Planning Guidelines

The actions below should be coordinated with the area ES&H team to make sure that the experiment or building is safe.

Fire Protection

- Remove the power source from all nonessential equipment. Lock out and tag the equipment in accordance with the procedures in Supplement 26.13.
- Remove all trash. Ensure that the area or building is free of rags, debris, and packing material.
- Ensure that means of egress are clear and unobstructed.
- Remove all unnecessary flammable and combustible liquids and gases.
- Make sure that all fire protection systems (fire sprinkler and alarm) remain in service.

Health Physics

- Remove sealed radioactive sources and as much of other radioactive materials as practical from the area or building.
- Consolidate and store liquids that must be retained for programmatic reasons in specifically designated HEPA-filtered glove boxes or hoods equipped with corrosion-resistant secondary containment. The ES&H team health physicist will determine whether a hood or glove box is needed.
- Install metal covers on all glove boxes and pass-out ports.
- Post current dose rates, nuclides, and contamination estimates (where known) on all glove boxes, hoods, and HEPA filters.

- Maintain the required alarms and negative ventilation on all glove boxes and hoods containing radioactive or hazardous chemical products or contamination. Specify the steps required for ensuring that the power for the alarms and ventilation systems remain on.
- Assay and properly dispose of any transuranic (TRU) waste.
- Remove and properly dispose of all radioactive waste from the area or building.
- Ensure
  - All radiation-producing equipment is de-energized. Lock out and tag the equipment in accordance with the procedures in Supplement 26.13.
  - Physical and/or administrative controls are in place to preclude the equipment from being re-energized without the appropriate review and approval.
  - Signs are posted properly in radiation and surface contamination areas.

Industrial Hygiene

- Remove all
  - Chemicals with shelf-life limitations (e.g., ethers).
  - Respirator supplies.
  - Food and perishable personal items (e.g., items in vending machines).
  - Compressed gas cylinders (except those used to support building safety and support systems), then purge and cap the gas lines.
  - Excess chemicals from the area to be temporarily shut down. To reduce the amount of material to be disposed of as waste, transfer the chemicals and materials to other buildings, operations, or CHEW; or return unused material to the manufacturer.
- Separate incompatible chemicals when it is necessary to keep them in the temporarily shutdown area. Put all liquids in secondary containment.
- Update the ChemTrack inventory with all chemical storage locations and owner changes. Send bar codes from empty containers to the ChemTrack Operations Group, L-333, to remove these items from the inventory.

Industrial Safety

- Lock out and tag inactive cranes.
- Seismically secure all equipment.
- Secure the chains on hand-operated hoists (i.e., chain falls) so that they cannot be operated and tagged in the same manner as power-operated equipment.
- Identify and tag all unused experimental equipment.
- Ensure that safety systems are operating.

- Discharge all energy sources (e.g., capacitors or pressurized systems). Lock out and tag these sources in accordance with the procedures in Supplement 26.13.

Environmental Protection

- Pump out all liquids remaining in any affected retention tank system. Formal closure of the tank system may be initiated if it is no longer needed. Clean the system if it is not formally closed.
- Package all wastes in work areas and transfer to the WAA within the regulatory time limits.
- Arrange with Hazardous Waste Management to have all wastes in WAAs picked up. Formal closure of WAAs may be initiated if the WAA is no longer needed.
- Determine if
  - — Equipment in the area shut down has been issued an air permit and if it must be canceled or transferred with the equipment to another building.
  - — Categorical wastewater processes should be removed from the sanitary sewer permit. Inform EPD for inclusion in the annual sanitary sewer permit application.
  - — Medical waste treatment equipment or generation points should be removed from the LLNL medical waste permit.
  - — Waste treatment permits, recycling permits, or treatability studies should be closed.
  - — Evidence of spills of radioactive or hazardous materials or wastes should to be reported to outside agencies or DOE and may require cleanup or remediation.
  - — Equipment with PCBs should be removed from the building for storage or disposal.
- Contact the environmental analyst to determine if any building drain connections require protection or modification.
- Remove equipment containing polychlorinated biphenyl (PCBs) oils that has reached the end of their useful life. Retrofill any equipment remaining with non-PCB oil in accordance with regulatory requirements. Place other equipment into storage and conduct inspections in accordance with the regulatory time limits.
- Identify equipment or devices that should be monitored or periodically inspected during shutdown.

4.2.2 Surveillance and Maintenance Guidelines

Notify the facility manager and ES&H team of any questionable conditions observed during the shutdown period.

Fire Protection

- Inspect all required fire protection systems and maintain them in accordance with current schedules.
- Make sure that means of egress remain clear and unobstructed.

Health Physics

Maintain a radiological surveillance program for contamination control, as described in the ES&H team's action plan, whether work is being conducted or not.

Industrial Hygiene

- Check
  - — Eyewashes and safety showers monthly to ensure they are accessible and functional, if hazardous materials are present.
  - — The building quarterly for the presence of rodents and birds.
  - — Any toxic storage areas quarterly.
  - — The condition of any asbestos-containing building materials every six months.
- Tag and label eyewashes that have been removed from service.

Industrial Safety

- Verify proper housekeeping.
- Test emergency systems and generators, as necessary. Maintain adequate lighting levels.
- Consult Plant Engineering regarding the development of routine maintenance procedures for the affected area(s).

Environmental Protection

- Inspect and maintain in serviceable condition all retention tanks containing (or that could potentially contain) waste that EPD has not officially closed.
- Conduct weekly inspections of WAAs that EPD has not officially closed.
- Conduct any NESHAPs monitoring and radionuclide inventory reporting as required.
- Inspect any equipment covered by an air permit in accordance with the conditions of that permit. Maintain logs as required.
- Inspect PCB-containing equipment in accordance with regulatory time limits.

4.3 Plan for Long-Term Shutdown (Mothballing)

"Mothballing" is the long-term shutdown of a building for future use or other disposition. The intent of mothballing is to maintain the building at a level of acceptable residual risk while minimizing costs and accomplishing LLNL's mission.

Use the guidelines that follow to develop a Shutdown, Surveillance, and Maintenance Plan for long-term shutdown (more than 12 months). Some of these guidelines may overlap among the safety disciplines; however, different perspectives on similar issues provide for a more comprehensive plan.

4.3.1 Pre-shutdown Planning Guidelines

Fire Protection

- Perform the steps in Section 4.2.1, "Fire Protection."

Health Physics

In addition to performing the steps in Section 4.2.1, "Health Physics," do the following:

- Check that equipment containing radioactive sources is properly labeled to ensure that the necessary precautions are taken when the equipment is disposed of or relocated.
- Determine if active containment (e.g., ventilation, chemistry fume hoods, glove boxes, HEPA filters) is necessary for radioactive materials. If required, outline steps to ensure that the power for these systems remain on.
- Conduct radiation and contamination surveys and ensure they are fully documented.

Industrial Hygiene

In addition to performing the steps in Section 4.2.1, "Industrial Hygiene," do the following:

- Abate all damaged asbestos-containing materials.
- Determine if the ventilation system for toxic material control should be left on or turned off.
- Determine if HEPA filters should be bypassed, secured, or left in line.
- Swipe areas to determine the status of cleanup.
- Document clean-up and decontamination activities completed before and during the inactive period.

Industrial Safety

In addition to performing the steps in Section 4.2.1, "Industrial Safety," properly store hazardous equipment and materials and/or lock out and tag equipment where necessary.

Environmental Protection

In addition to performing the steps in Section 4.2.1, "Environmental Protection," empty and clean all product tanks (e.g., diesel fuel tanks).

4.3.2 Surveillance and Maintenance Guidelines

Notify the facility manager and ES&H team of any questionable conditions observed during the shutdown period.

Fire Protection

- Perform the steps in Section 4.2.2, "Fire Protection."

Health Physics

Develop and conduct a routine surveillance program to maintain proper control of any radioactive material or radiation-producing equipment. This program should include the following, as appropriate:

- A swipe sampling program for alpha, beta, and tritium testing.
- Radiation surveys.
- Retention tank monitoring.
- Dumpster monitoring.
- Radiation-detection equipment, such as hand and foot counters and radiation survey meters.
- Stack monitoring.
- Verification that radiation-producing equipment is secured.

Industrial Hygiene

In addition to performing the steps in Section 4.2.2, "Industrial Hygiene," check the operating ventilation systems and HEPA filters annually.

Industrial Safety

In addition to performing the steps in Section 4.2.2, "Industrial Safety," do the following:

- Schedule regular industrial safety inspections with the ES&H team, as appropriate.
- Ensure that Hazards Control receives the required inspection reports from other support organizations for the inactive building. Report any discrepancies to the Program.
- Review the ES&H team's action plan and incorporate requirements in the Shutdown, Surveillance, and Maintenance Plan, as appropriate.

Environmental Protection

In addition to performing the steps in Section 4.2.2, "Environmental Protection," do the following:

- Conduct inspections of secondary containment basins and manage accumulated rainwater according to LLNL protocol.
- Conduct daily inspections of all hazardous retention tank systems and weekly inspections of nonhazardous systems that have not been closed.

4.4 Buildings to be Retired in Place (RIP) or Demolished

4.4.1 General

Plant Engineering (Space and Site Planning) should be contacted for institutional requirements when buildings are to be returned to the institution for re-assignment, retirement, or demolition. Further guidance on retiring or demolishing buildings can be found in *Policy and Procedure for the Disposition of Space*, which is available from the Directorate Facility Manager or the Space and Site Planning Office.

4.4.2 Specific ES&H Guidelines

In addition to the guidelines in Sections 4.2 and 4.3, the steps below apply to buildings that will be retired in place or demolished.

Fire Protection

- Contact Fire Protection Engineering to determine which fire protection / detection systems should remain operational.
- Contact the Emergency Management Division (Fire Department) to have all portable fire extinguishers removed from the building once it is vacated.

Health Physics

- Remove radioactive materials and any contaminated items (e.g., ductwork, underpaint contamination).

Industrial Hygiene

- Remove all chemicals regardless of shelf-life.
- Update the ChemTrack inventory with all chemical storage location and owner changes. Send bar codes from empty containers to the ChemTrack Operations Group, L-633, to remove these items from inventory.

4.4.3 Surveillance and Maintenance

Once a building has been accepted by the institution for re-assignment, retirement, or demolition, surveillance and maintenance activities for that building become the responsibility of the institution. The building generally is locked, with access being strictly controlled by either Space and Site Planning or the Emergency Management Division. Generally, routine ES&H surveillance tours of the building will no longer be required. Representatives of the institution

will determine an appropriate frequency and scope for periodic condition assessments of the building.

4.5 Transfer of Operations or Buildings

Transfer of an operation or workspace between organizations should be managed as separate processes (i.e., terminating one activity and beginning another) with an appropriate transition period. Ideally, the transfer process is a joint effort between the individual parties to plan and document the details using a graded approach. The outgoing and incoming organizations have a shared responsibility to consider the ES&H implications of the transfer. A transfer plan that evaluates the status of the building and equipment, inventory of useful materials and wastes, as well as operating and ES&H procedures and documentation shall be prepared. The transfer process must also determine which organization will take responsibility for correcting any deficiencies that exist.

Outgoing organization planning considerations. The outgoing organization should review the pre-shutdown planning guidelines in this supplement that are applicable to terminating an activity, and take the actions necessary for the materials, equipment, and building features that are not to be transferred. Information in the ChemTrack database about material storage location and ownership shall be modified as needed.

Transition considerations. The outgoing and incoming organizations should review the status of the current operation to determine the responsibility for potential concerns such as identifying unknown materials and wastes; transferring permits; and assuming the legacy of equipment, building, and environmental deficiencies.

Incoming organization planning considerations. Chapter 2, Section 2.2, of the *Health & Safety Manual* covers the requirements for work planning that shall be applied at the onset of the new activity. The incoming organization should evaluate any equipment and inventory to be received; review and update procedures, permits, and ES&H documentation for the operation or building; and determine workers' training and qualification status.

A pre-start and readiness review shall be conducted as a final check before a new activity begins.

4.6 Reactivation of the Building or Operation

Before reactivating a shutdown building or an operation, the responsible AD shall ensure that the building or operations programmatic personnel develop, agree upon, and implement a start-up plan. See Chapter 2 of the *Health & Safety Manual* for guidance on developing start-up plans. LLNL nuclear facilities that

have been formally shutdown must follow the restart requirements in DOE Order 5480.31.

5.0 Responsibilities

Each AD is assigned responsibility for specific buildings and for making sure that operations within those buildings are in compliance with ES&H regulations. Thus, before a building or any of its parts can be shut down, or before operations can be terminated, the cognizant facility AD shall ensure that programmatic personnel develop, agree upon, and implement a shutdown plan.

Plan Review and Approval. As a minimum, the plan shall be reviewed and signed by

- The author of the plan. This individual usually would be responsible for carrying out the plan.
- The leader of the ES&H team that supports the building.
- The Program Leader or Deputy Associate Director (or equivalent) authorized to commit funds and resources for executing the plan.
- The Plant Engineering Maintenance and Operations Department Head.

6.0 LLNL Contacts

Direct questions or concerns regarding this supplement to

- Field Support
  - — ES&H Teams (includes environmental analysts)
    Team 1 (Livermore, ext. 2-5211; Site 300, ext. 3-5245)
    Team 2 (ext. 2-6126)
    Team 3 (ext. 2-8794)
    Team 4 (ext. 3-9562)

- Institutional Issues
  - — Environmental Protection Department, Operations and Regulatory Affairs Division (ext. 3-6577)
  - — Hazards Control
    Health Physics (ext. 2-1214)
    Industrial Hygiene (ext. 4-3295)
    Industrial Safety (ext. 2-1322)
    Fire Protection Engineering (ext. 3-5148)

Appendix A

Sample LLNL Activity-Level Closeout Procedure

The procedure in this appendix may be used when a relatively small-scale operation is terminated, the responsible individual moves to another job, or responsibility for the building space is transferred to another individual or organization. The objectives of this procedure are to (1) ensure that hazardous wastes and materials are properly disposed of or reused, (2) minimize the generation of wastes, (3) identify the individual who will assume responsibility for the remaining materials, equipment, or building; and (4) update the ChemTrack database.

Complete the closeout procedure below. Use additional sheets if necessary. Give the completed form to the new responsible person. Transfer any open DefTrack items to the new owner, but notify the facility manager of your plans.

Today's date _____

Name of person responsible for closeout _____

Facility directorate _____ Phone number _____

Closeout area: Building _____ Room _____ RMMA: Yes ____ No ____

Lab/Shop/Experiment Name _____

Estimated date of closeout _____

If known, provide the name of the new responsible person _____

Closeout Procedure

1. On Form A,
   - List any hazardous, mixed, or radioactive materials or contaminated equipment involved in the operations of this area or activity?
   - List any plans for reuse, storage, or decontamination.
2. Contact the ES&H team for assistance in evaluating the hazards to be controlled or eliminated before closeout.
3. Arrange for the safe transfer or storage, or both, of items identified in step 1 that will be reused or excessed. Update the ChemTrack inventory with all chemical storage location and owner changes. Send bar codes from empty containers to the ChemTrack Operations Group, L633, to remove these items from the inventory.

4. Make arrangements for items identified as waste in step 1 to be disposed of within the regulatory time limits and in accordance with LLNL waste labeling, packaging, and transportation procedures.

5. On Form B,
   - List any deficiencies, permits, exemptions, variances, or waste handling areas (e.g., WAAs, waste retention tank systems, recycling and treatment units) that affect the area and require formal closure.

   - List any categorical wastewater discharge processes in place that is monitored by the Environmental Protection Department. Contact the ES&H team environmental analyst for assistance, if necessary.

6. Make arrangements for a final review and "walk-through" with the ES&H team and the facility manager so they can verify that the closeout has been properly completed.

Closeout approval signatures:

Person responsible for closeout _____ Date _____
(Certifies closeout was completed)

New responsible person _____ Date _____
(Assumes responsibility for the area)

Facility Manager _____ Date _____

ES&H Team Leader _____ Date _____

By signing this form, the facility manager verifies that the "walk-through" and closeout have been completed. The facility manager is responsible for retaining the original copy of the completed forms and for providing copies to the ES&H team leader, facility directorate assurance managers, the person responsible for the closeout, and the new responsible person.

Form A

Name _____ Phone No. _____ Date _____

Area to be vacated _____

List materials, waste, or equipment	Describe plans for disposal, storage, decontamination, and/or reuse

Form B

Name _____ Phone No. _____ Date _____

Area to be vacated _____

List open deficiencies, permits, exemptions, variances, categorical discharge processes, or waste handling facilities requiring formal closure.